Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-15   (Cancelled)

16.   (Previously presented)   The image pickup system according to claim 43, wherein the noise estimating means comprises an upper limit value setting means for setting an upper limit value on the estimated amount of noise.

17.   (Previously presented)   The image pickup system according to claim 43, wherein the noise reducing means comprises:

threshold value setting means for setting an amplitude value of the noise as a threshold value for each pixel or for each specified unit area comprising a plurality of pixels on the basis of the amount of noise estimated by the noise estimating means; and

smoothing means for excluding the amplitude components in the signals which are below the threshold value set by the threshold value setting means.

Claim 18.   (Cancelled)

19.   (Previously presented)   The image pickup system according to claim 43, wherein the parameter calculating means comprises signal value calculating

means for calculating the signal value levels by averaging a plurality of pixel values in a nearby region of a specified size or in the unit area that includes the pixel of interest.

Claim 20.   (Cancelled)

21.   (Previously presented)   The image pickup system according to claim 43, wherein the image pickup element comprises an OB (optical black) region, and the parameter calculating means comprises:

variance calculating means for calculating the variance of the signals in the OB region; and

temperature estimating means for estimating the temperature of the image pickup element on the basis of the variance calculated by the variance calculating means.

22.   (Previously presented)   The image pickup system according to claim 43, wherein the parameter calculating means comprises gain calculating means for determining the gain on the basis of at least one type of information selected among the ISO sensitivity, exposure information and white balance information.

23.   (Previously presented)   The image pickup system according to claim 43, wherein the parameter calculating means comprises shutter speed calculating means for determining the shutter speed during the shooting from exposure information.

24.   (Previously presented)   The image pickup system according to claim

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43, wherein the noise amount calculating means calculates the amount of noise N using the signal value level L of the signals, the temperature T of the image pickup element, the gain G for the signals and the shutter speed S during shooting as parameters, and the noise amount calculating means comprises:

coefficient calculating means for calculating four coefficients A, B, C and D on the basis of three functions a(T, G), b(T, G) and c(T, G) using the temperature T and gain G as parameters, and a function d(S) using the shutter speed S as a parameter; and

function calculating means for calculating the amount of noise N on the basis of a functional equation

$$N = (AL^B + C)D$$

defined by the four coefficients A, B, C and D calculated by the coefficient calculating means.

25. (Original)   The image pickup system according to claim 24, wherein the noise amount calculating means further comprises assigning means for assigning standard parameter values, and the parameters are values calculated by the parameter calculating means, or standard values assigned by the assigning means.

Claims 26-27.   (Cancelled)

28. (Currently amended)   An image processing ~~program stored in a computer readable medium executed by a computer in an image pickup system, for performing routines, said program~~ method, comprising:

~~a noise estimating routine for~~ obtaining digitized signals representing

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an image of an object captured by an image pickup system having an array of pixels for converting the image into said digitized signals;

estimating an amount of noise contained in the digitized signals from ~~an image pickup element in the image pickup system in which a plurality of pixels are arranged, either for~~ one of each pixel [[or]] and for ~~each~~ a specified unit area of the image pickup element comprising a plurality of pixels;

~~a threshold value setting routine for~~ setting an amplitude value of the noise as a threshold value for one of each pixel ~~or each~~ and the specified unit area ~~comprising a plurality of pixels~~ based on the ~~basis of the~~ estimated amount of noise ~~estimated by the noise estimating routine~~; and

~~a smoothing routine for~~ excluding the amplitude components in the signals that are equal to or less than the threshold value ~~set by the threshold value setting routine~~ to thereby obtain a high-quality image.

Claim 29.   (Cancelled)

30.   (Currently amended)   An image processing ~~program stored in a computer readable medium executed by a computer in an image pickup system for performing routines, said program~~ method, comprising:

obtaining digitized signals representing an image of an object captured by an image pickup element of an image pick system having an array of pixels for converting the image into said digitized signals;

~~a variance calculating routine for calculating~~ obtaining a signal variance in [[OB]] optical black (OB) regions of digitized signals from [[an]] the image pickup element in the image pickup system in which a plurality of pixels are arranged and which has an OB ~~(optical black)~~ region;

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a ~~temperature estimating routine for~~ estimating [[the]] a temperature of the image pickup element based on the ~~basis of the~~ signal variance ~~calculated by the variance calculating routine~~;

a ~~parameter calculating routine for calculating~~ obtaining parameters based on ~~the basis of~~ at least one type of information selected from among the estimated temperature of the image pickup element ~~estimated by the temperature estimating routine~~, a signal value level of the digitized signals, a gain for the digitized signals and a shutter speed during shooting of a shutter in the pickup system;

a ~~noise amount calculating routine for calculating~~ determining an amount of noise estimated to be contained in the digitized signals based on ~~the basis of the~~ said parameters ~~calculated by the parameter calculating routine, either~~ for one of each pixel [[or]] in the array and a specified unit area of the image pickup element comprising a given plurality of pixels; and

a ~~noise reducing routine for~~ reducing the estimated noise in the digitized signals based on the ~~basis of the~~ amount of noise ~~calculated by the noise amount calculating routine~~ to thereby obtain a high-quality image.

31. (Currently amended) An image processing ~~program stored in a computer readable medium executed by a computer in an image pickup system for performing routines, said program~~ method, comprising:

obtaining digitized signals representing an image of an object captured by an image pickup element of an image pickup system having an array of pixels for converting the image into said digitized signals;

a ~~parameter calculating routine for calculating~~ determining a signal value level L of said digitized signals from [[an]] the image pickup element in the

pickup system in which a plurality of pixels are arranged, <u>based on</u> a temperature T of the image pickup element, a gain G for the signals and a shutter speed S of a shutter in the <u>image</u> pickup system <u>and obtained</u> during shooting, as parameters;

~~a coefficient calculating routine for calculating~~ <u>determining</u> four coefficients A, B, C and D <u>based</u> on ~~the basis of~~ three functions a(T, G), b(T, G) and c(T, G) using the temperature T and gain G as parameters, and a function d(S) using the shutter speed S as a parameter;

~~a function calculating routine for calculating~~ <u>determining</u> an amount of noise N estimated to be contained in the signals ~~on the basis of~~ <u>employing</u> a functional equation

$$N = (AL^B + C)D$$

defined by the <u>aforesaid</u> four coefficients A, B, C and D ~~calculated by the coefficient calculating routine, either~~ for <u>one of</u> each pixel <u>in the pixel array and</u> [[or]] for ~~each~~ <u>a</u> specified unit area <u>of the image pickup element</u> comprising a <u>given</u> plurality of pixels; and

~~a noise reducing routine for~~ reducing the noise in the signals <u>based</u> on ~~the basis of~~ the <u>determined</u> amount of noise ~~calculated by the function calculating routine~~ <u>to thereby provide a high-quality image.</u>

Claims 32-34.   (Cancelled)

35.   (Previously presented)   The image pickup system according to claim 44, wherein the noise estimating unit comprises an upper limit value setting unit for setting an upper limit value on the estimated amount of noise.

36.   (Previously presented)   The image pickup system according to

claim 44, wherein the noise reducing unit comprises:

a threshold value setting unit for setting an amplitude value of the noise as a threshold value for each pixel or for each specified unit area comprising a plurality of pixels on the basis of the amount of noise estimated by the noise estimating unit; and

a smoothing unit for excluding the amplitude components in the signals which are below the threshold value set by the threshold value setting unit.

37.   (Previously presented)   The image pickup system according to claim 44, wherein the parameter calculating unit comprises a signal value calculating unit for calculating the signal value levels by averaging a plurality of pixel values in a nearby region of a specified size or in the unit area that includes the pixel of interest.

38.   (Previously presented)   The image pickup system according to claim 44, wherein the image pickup element comprises an OB (optical black) region, and the parameter calculating unit comprises:

a variance calculating unit for calculating the variance of the signals in the OB region; and

a temperature estimating unit for estimating the temperature of the image pickup element on the basis of the variance calculated by the variance calculating unit.

39.   (Previously presented)   The image pickup system according to claim 44, wherein the parameter calculating unit comprises a gain calculating unit for determining the gain on the basis of at least one type of information selected among

the ISO sensitivity, exposure information and white balance information.

40. (Previously presented) The image pickup system according to claim 44, wherein the parameter calculating unit further comprises a shutter speed calculating unit for determining the shutter speed during the shooting from exposure information.

41. (Previously presented) The image pickup system according to claim 44, wherein the noise amount calculating unit calculates the amount of noise N using the signal value level L of the signals, the temperature T of the image pickup element, the gain G for the signals and the shutter speed S during shooting as parameters, and the noise amount calculating unit comprises:

a coefficient calculating unit for calculating four coefficients A, B, C and D on the basis of three functions a(T, G), b(T, G) and c(T, G) using the temperature T and gain G as parameters, and a function d(S) using the shutter speed S as a parameter; and

a function calculating unit for calculating the amount of noise N on the basis of a functional equation

$$N = (AL^B + C)D$$

defined by the four coefficients A, B, C and D calculated by the coefficient calculating unit.

42. (Previously presented) The image pickup system according to claim 41, wherein the noise amount calculating unit further comprises an assigning unit for assigning standard parameter values, and the parameters are values calculated by the parameter calculating unit, or standard values assigned by the assigning

unit.

43.   (Previously presented)   An image pickup system comprising:

noise estimating means comprising:

parameter calculating means for calculating parameters of a function using the signal value level of digitized signals from an image pickup element in which a plurality of pixels are arranged, and at least one type of information selected from, the temperature of the image pickup element, the gain for the signals and the shutter speed during shooting;

noise amount calculating means for calculating an amount of noise *(N)* contained in the signals, for one of each pixel and each specified area comprising a plurality of pixels responsive to the parameters calculated by the parameter calculating means; and

noise reducing means for reducing the noise contained in the signals on the basis of the amount of noise calculated by the noise calculating means.

44.   (Previously presented)   An image pickup system comprising:

a noise estimating unit comprising:

a parameter calculating unit for calculating parameters of a function using the signal value level of digitized signals from an image pickup element in which a plurality of pixels are arranged, and at least one type of information selected from, the temperature of the image pickup element, the gain for the signals and the shutter speed during shooting;

a noise amount calculating unit for calculating an amount of noise *(N)* contained in the signals, for one of each pixel and each specified area comprising a plurality of pixels responsive to the parameters calculated by the parameter

calculating unit; and

      a noise reducing unit for reducing the noise contained in the signals on the basis of the amount of noise calculated by the noise calculating unit.

     45.   (Previously presented)   The image pickup system according to claim 43, the noise amount calculating means employing said function which derives a noise amount according to said signal level.

     46.   (Previously presented)   The image pickup system according to claim 44, the noise amount calculating unit employing said function which derives a noise amount according to said signal level.